

## Overview of Lesson Plan C (Grades 6–8)

This lesson introduces students to the properties of mercury and the possible health hazards of exposure to mercury. In addition, it introduces students to a scientific career—being a health educator. It is based on Next Generation Science Standard (MS-PS1-3) and Common Core Language Arts Standards (RST.6-8.1, WHST.6-8.8, RST.6-8.9, RST.6-8.10, SL.6-8.4, and SL.6-8.5) for grades 6–8.

Following a brief warm up, students begin individually with Part 1, in which they learn about the hazards of mercury exposure by engaging in fun and interactive web-based activities from the [Don't Mess With Mercury—For Students](#) webpage. Then, individually or in groups of up to four, they proceed to Part 2, in which they create public service announcements of their own using print and on-line resources. This lesson is designed for two to three class periods.

We recommend that teachers familiarize their students with the following concepts prior to using this lesson plan:

- Periodic Table of Elements, including classes of elements (e.g., metals, nonmetals, etc.)
- Physical properties of matter

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*Teachers, ATSDR's Don't Mess With Mercury website is 508 compliant and available in English & Spanish.*

**Teachers, your feedback is very important for improving these materials.**  
This lesson plan will prompt you to take a quick survey and provide the data for each class here:  
[https://www.surveymonkey.com/s/DMWM\\_Quiz](https://www.surveymonkey.com/s/DMWM_Quiz)  
**Tip:** In addition to a computer, this survey link can be easily accessed on a smartphone!

### Learning Objectives

Students will be able to

1. Describe characteristics (physical properties) of elemental mercury
2. Explain health effects of exposure to elemental mercury
3. Identify objects that may contain elemental mercury
4. Explain what to do if they find mercury
5. Use evidence from various resources to communicate about mercury exposure



### Materials

1. One computer and set of headphones per student
2. Internet access, including access to [www.youtube.com](http://www.youtube.com)
3. Double-sided copies of Student Handouts ([pages 8–17](#)), one set per student
4. Access to computer program: Microsoft PowerPoint
5. **Recommended:** Books about mercury ([see page 19 for suggestions](#)).

### Preparation

1. Reserve computer lab and/or library.
2. Reserve library books about mercury as supplementary resources.
3. Print double-sided student handouts ([pages 8–17](#)). Be sure to modify the grading rubric to your preferences prior to printing.
4. Print one copy of lesson plan for yourself.
5. Divide students into groups of up to four.
6. Write/project warm-up questions on chalkboard or screen.

**Recommended:** To save time, open [Don't Mess With Mercury—For Students](http://www.atsdr.cdc.gov/dontmesswithmercury/students.html) webpage on available computer(s) prior to students' arrival. ([www.atsdr.cdc.gov/dontmesswithmercury/students.html](http://www.atsdr.cdc.gov/dontmesswithmercury/students.html))

### Optional:

1. Print 1 copy of Teacher's Supplementary Sheet ([pages 18–19](#)) to have handy.
2. Talk to school leadership about sharing students' public service announcements during school assembly and/or over intercom.
3. Invite guests who may encounter mercury to attend student presentations (e.g., school janitors, science department safety specialist, other teachers and students).
4. If necessary, obtain permission to post student work throughout the school to educate student body.

## Teacher's Guide—Lesson Plan A

### Lesson Components

1. Warm Up—15 minutes
2. Part 1—Online Activities—35 minutes
3. Part 2—Introduction to Public Service Announcements (PSAs)—10 minutes
4. Part 3—Students Develop PSAs—1.5 class periods, at least
5. Part 4—Exit Poll—5 minutes
6. Part 5—Share PSAs

### Warm Up (15 minutes)

Display the warm-up questions for all to see.

Read the warm-up questions aloud and ask students to discuss answers with their neighbors and write them down.

When students are done with the three questions, let volunteers share answers for each question and provide the correct answers.

### Part 1—Online Activities

(35 minutes; use website and student handout, part 1)

Distribute Student handout packet ([pages 8–17](#)).

Note: Answer key to Student Handout, Part 1 can be found on [page 7](#) of this lesson plan.

Tell students:

*We are going to learn about a very interesting element, mercury. Mercury is a very toxic metal that is liquid at room temperature. Toxic means that it is harmful to our health. You might be wondering:*

- *What does it look like?*
- *Where can we find it?*
- *How is it toxic?*
- *What should I do if I ever find it?*

*You'll find out all the answers to these questions after completing the online activities in Part 1. Use your handout as a guide and raise your hand if you need my assistance. Let me know when you are finished and I will assist you in moving on to Part 2.*

## Warm Up Questions

### 1) What is an element?

*(Answer: A chemical substance made of only one kind of atom; a chemical in its purest form)*

### 2) What are the three main classes of elements on the Periodic Table?

*(Answer: Metals, metalloids, and non-metals)*

### 3) List five physical properties you could use to describe an element:

*(Answer: color, ability to conduct electricity, state of matter at room temperature, density, luster, malleability, hardness, boiling point, melting point, etc.)*

## Part 2—Introduction to PSAs (10 minutes; use on-line public service announcements)

Tell students:

*As you can see from these stories, being exposed to mercury can be a serious problem.*

- *Because mercury is so toxic to living things, even a tiny amount can be poisonous.*
- *Exposure to mercury can happen from touching it, inhaling it, or swallowing it.*
- *Liquid mercury gives off invisible and odorless vapor. People around it may be breathing it in and may not even realize it.*



*One of the ways to educate people about mercury exposure is to use public service announcements, commonly referred to as PSAs. Public service announcements are advertisements. Instead of promoting a product for sale, they deliver educational messages. These messages can be presented on the radio or TV, announced at events, or printed in materials like newspapers or magazines.*

- *Raise your hand if you have watched, seen, or heard a commercial about how smoking is bad for your health.*
- *How about if you have watched, seen, or heard a message about wearing seatbelts?*
- *Making an emergency plan for your family in case there is a natural disaster?*
- *Can anyone think of others? (e.g., hazards of drinking and driving, texting and driving)*

*We are now going to watch public service announcements about mercury.*

Play:

1. ATSDR's Don't Mess with Mercury PSA: <http://www.atsdr.cdc.gov/dontmesswithmercury/students.html> and ask volunteers for feedback:

*Raise your hand to share with the class how this PSA was educational. In other words, what could someone who doesn't know about mercury learn from watching this video?*

*A PSA is more effective if it is appropriate for its audience. For which age group is this PSA targeted?*

2. U.S. Environmental Protection Agency's (EPA) Mercury is Toxic! PSA: <http://www.epa.gov/region9/psa/mercury/> and ask students:

*What could someone learn by watching this video?*

3. OHIO EPA's PSA about mercury vapors <http://www.youtube.com/watch?v=tpqP3ReC1cQ> and have students volunteer feedback:

*What does this PSA teach you about mercury vapors?*

Tell students:

*Throughout history, advances in science and technology have revealed different uses for mercury. Scientific research has also discovered the dangers of exposure to mercury. Not everyone knows about health hazards, so health educators must teach the public how to be safe and healthy.*

*To learn about mercury, you will do some research about where it could be found and what to do if you encounter it. Then, you will become a health educator and design your own PSAs.*

**Part 3—Students Develop PSAs** (at least 1.5 class periods)

Tell students:

*You may work individually or in groups of up to four to develop your own public service announcement about mercury. You may wish to create a skit, a poster, or a radio announcement. If you don't want to create a PSA, you can work by yourself and write an article that could be published in a newspaper.*

*You can use books, selected websites, and other printed material to do your research.*

Teacher should:

- *Help students get into their groups and distribute project-specific handouts (skit, poster, radio announcement and newspaper article). Assign groups if necessary.*
- *Show all students how/where to find additional resources: Internet, books, pamphlets, etc.*
- *Once students are ready to begin working, inform them about citing information.*

Tell students:

*As you find useful information about mercury for your project, keep track of your sources, or where you got the information. The Project Submission Form has instructions on how to make a list of the sources you used for the Works Cited Page. Why might someone want to know where you got your information?*

(Appropriate responses may include the audience wanting to find more information about mercury or determine if the sources are reliable.) Consider explaining what a reliable source is.

Hand out grading rubric.

Tell students:

*This portion will be graded using the rubric I have already provided to you on the back side the handout you used for Part 1.*

*We will have \_\_\_\_\_ class period(s) to work on Part 2. That gives you about \_\_\_\_\_ minutes total. Let me know if you have questions.*

**Part 4—Exit Poll** (5 minutes)

Read these questions aloud. Students should raise their hands to vote for what they think is the correct answer. If you suspect that students may not answer honestly, consider asking them to put their heads down while voting. After voting, provide students with correct answers (in **bold** text). Record the number of students who answer correctly.\*

Tell students:

*Let's take a quick poll to see what you have learned about mercury. On your own, answer the following questions, which I will read aloud. After you listen to all the answers, write the letter corresponding to your answer in the Exit Poll section of your Grading Rubric. Once everyone answers all the questions, raise your hand when I say the letter that corresponds with your answer. The Exit Poll is not graded, so please answer honestly.*

1. At room temperature, mercury is not a
  - a. **solid**
  - b. liquid
  - c. gas

2. Inhaling mercury can lead to
  - a. trembling
  - b. mood changes
  - c. memory loss
  - d. all of these**
3. Which of the following objects could contain mercury?
  - a. thermostat
  - b. certain light bulbs
  - c. a thermometer
  - d. all of them**
4. If you find mercury, you should
  - a. play with it and show it to your friends. This could be fun!
  - b. pour it down the drain if it gets messy. Better clean it up before somebody else finds it!
  - c. leave the room and tell an adult right away. This could be bad!**
  - d. smell it to see if it has an interesting odor.

\*ATSDR would like your feedback about this lesson plan. Please help us improve this lesson plan by completing a short electronic survey ([https://www.surveymonkey.com/s/DMWM\\_Quiz](https://www.surveymonkey.com/s/DMWM_Quiz)).

Please note that your participation in this survey is voluntary and your responses will be confidential. Use of the data obtained from this survey will be in aggregate form and not contain any personal identifiers. Your responses will be used to help improve this lesson plan and better tailor the lesson plans. Your participation is greatly appreciated.

## **Part 5—Share PSAs** *(time will vary)*

Allow students to share their presentations with the class (and invited guests).

Complete this worksheet by doing the online activities in order.

Begin with the following website: <http://www.atsdr.cdc.gov/dontmesswithmercury/students.html>

1. **Watch the video.** Wear headphones if available. Fill in the blanks:  
If a student finds mercury, he/she shouldn't **play** with it and should find an **adult**.
  2. **Get the facts.** What are some physical properties of Mercury?
    - a. Color and appearance: **shiny silver colored liquid at room temperature**
    - b. How would you describe mercury's density? **Very heavy; two tablespoons weigh about one pound**
  3. **How does mercury affect the human body?** Write down examples of what could happen.
 

Brain & nervous system: **Several responses are possible including: changes in mood, difficulty sleeping, trembling, difficulty with muscle coordination**

Eyes: **red eyes**

Head: **headache**

Mouth: **tasting metal, swollen gums, drooling**

Throat: **sore throat**

Heart: **high blood pressure, fast heart rate**

Lungs: **cough, pain when breathing, feeling out of breath, damage to the lungs**

Stomach/intestines: **feeling sick to your stomach, nausea, diarrhea, not feeling hungry**

Skin: **red, itchy rashes, peeling hands and feet**

Body: **fever, feeling tired, muscle aches**
  4. **Learn the history.** How has mercury been used in the past? Give three examples of uses of mercury and the time period when it was used that way. **Several responses are possible including:**
    - a. **1500 B.C.E. Ancient Egyptians used mercury in cosmetics**
    - b. **1600s scientists tried to use mercury to turn it into gold**
    - c. **1800s mercury was used by hat makers to soften the wool in the hats**
  5. **Play the game.** Wear headphones if available.
- Now go to the following website to learn more about Mercury's physical properties:  
<http://www.youtube.com/watch?v=tpqP3ReC1cQ>.
6. Mercury's state at room temperature: **L i Q U i D** and a **G A S**

Name: \_\_\_\_\_ Class period: \_\_\_\_\_ Date: \_\_\_\_\_

Complete this worksheet by doing the online activities in order.

Begin with the following website: <http://www.atsdr.cdc.gov/dontmesswithmercury/students.html>

1. **Watch the video.** Wear headphones if available. Fill in the blanks:

If a student finds mercury, he/she shouldn't \_\_\_\_\_ with it and should find an \_\_\_\_\_

2. **Get the facts.** What are some physical properties of Mercury?

a. Color and appearance: \_\_\_\_\_

b. How would you describe mercury's density? \_\_\_\_\_

3. **How does mercury affect the human body?** Write down examples of what could happen.

Brain & nervous system: \_\_\_\_\_

Eyes: \_\_\_\_\_

Head: \_\_\_\_\_

Mouth: \_\_\_\_\_

Throat: \_\_\_\_\_

Heart: \_\_\_\_\_

Lungs: \_\_\_\_\_

Stomach/intestines: \_\_\_\_\_

Skin: \_\_\_\_\_

Body: \_\_\_\_\_

4. **Learn the history.** How has mercury been used in the past? Give three examples of uses of mercury and the time period when it was used that way.

a. \_\_\_\_\_

b. \_\_\_\_\_

c. \_\_\_\_\_

5. **Play the game.** Wear headphones if available.

Now go to the following website to learn more about Mercury's physical properties:

<http://www.youtube.com/watch?v=tpqP3ReC1cQ>.

6. Mercury's state at room temperature: \_\_\_\_ i \_\_\_\_ i \_\_\_\_ and a \_\_\_\_ \_\_\_\_ \_\_\_\_



# don't mess with MERCURY

## STUDENT HANDOUT

### PART 2 Grading Rubric

Name: \_\_\_\_\_ Class period: \_\_\_\_\_ Date: \_\_\_\_\_

	Points Possible	What I think learned	Points Earned
<b>Question 1:</b> What are the characteristics (physical properties) of elemental mercury? <ul style="list-style-type: none"> <li>• Provided 4 physical properties of mercury (1 point each)</li> </ul>	4		
<b>Question 2:</b> How can exposure to mercury affect the human body? <ul style="list-style-type: none"> <li>• Provided 5 health effects of exposure to mercury (1 point each)</li> </ul>	5		
<b>Question 3:</b> Which objects might contain mercury? <ul style="list-style-type: none"> <li>• Listed 3 objects that contain elemental mercury (1 point each)</li> </ul>	3		
<b>Question 4:</b> What should a student do if s/he finds mercury? <ul style="list-style-type: none"> <li>• Correctly explained what students do if they find mercury (2 points)</li> </ul>	2		
<b>Works cited</b> <ul style="list-style-type: none"> <li>• Listed at least 4 sources (1 point each)</li> <li>• Used the correct format (1 point)</li> </ul>	5		
<b>Quality of work</b> <ul style="list-style-type: none"> <li>• Neat in appearance (3 point)</li> <li>• Clearly written &amp; used helpful pictures (if newspaper article or poster) (3 points)</li> </ul>	6		
<b>Classroom Presentation</b> <ul style="list-style-type: none"> <li>• Spoke audibly and clearly (3 points)</li> <li>• Spoke with enthusiasm (2 points)</li> </ul>	5		
	<b>Final Grade</b>		

### Exit Poll

My answers:

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ 4. \_\_\_\_\_

## Instructions

Your group has decided to do a skit to educate your peers about the dangers of mercury exposure.

Names of group members: \_\_\_\_\_

Your skit should teach your audience answers to the following four questions:

1. What are the characteristics (physical properties) of elemental mercury?
2. How can exposure to mercury affect the human body?
3. Which objects might contain mercury?
4. What should a student do if s/he finds mercury?

## Step 1: Background Research

Your group will need two separate sheets of paper.

- One should be used as your “Answer Sheet” to write down the answers to the four questions above.
- The second sheet is your “Works Cited” page—a list that includes every source of information you used to answer these questions.

Use available **Internet** and **print** resources (like books and pamphlets).

Here is the format for listing sources on your Works Cited page:

### For books or other printed resources:

Author(s). “Title of Article or Chapter”. Publication Title. Date published. pages #-#

### For websites:

Author(s). “Website Title”. Date published or updated. www.websitelink.com

### For photos:

Photographer’s Name. www.websitelink.com

Authors or photographers name should be listed as last name, first initial. If there are multiple authors, separate each individual by a comma, e.g., Doe A., Ray B., and Mei C.

If no author is listed, you can use an organization’s name instead, e.g., National Institutes of Health.

If you cannot find one of the components mentioned in the format above, just skip that part and provide the information that is available.

**Where can you find reliable information about mercury for your presentation?**

- Agency for Toxic Substances and Disease Registry's Don't Mess with Mercury Website—For Students: <http://www.atsdr.cdc.gov/dontmesswithmercury/students.html>
- "Mercury Containing Devices/Products" by North Dakota Department of Health—Waste Management: <http://www.ndhealth.gov/wm/Mercury/MercuryContainingDevicesProducts.htm>
- Public Service Announcement from EPA Region 9: <http://www.epa.gov/region9/psa/mercury/>
- "Mercury" by National Institutes of Health: <http://kids.niehs.nih.gov/explore/pollute/mercury.htm>
- US EPA's Mercury Page: <http://www.epa.gov/mercury/index.html>
- Mercury in Schools Case Studies: <http://www.epa.gov/mercury/casestudies.htm#3>

You may also want to consult library books on mercury.

**Step 2: Write the script**

On a new sheet of paper, write what each actor will say. The skit should take three to four minutes to perform. If you need help, ask your teacher. Assign roles to group members and practice your skit.

Completion: Your group should turn in one package containing one copy of each of the following:

- Project Submission Form
- Answer Sheet
- "Works Cited" page
- Script
- Each member's grading rubric



## Instructions

Your group has decided to design a poster to educate your peers about the dangers of mercury exposure.

Names of group members: \_\_\_\_\_

Your poster should teach your audience answers to the following four questions:

1. What are the characteristics (physical properties) of elemental mercury?
2. How can exposure to mercury affect the human body?
3. Which objects might contain mercury?
4. What should a student do if s/he finds mercury?

## Step 1: Background Research

Your group will need two separate sheets of paper.

- One should be used as your “Answer Sheet” to write down the answers to the four questions above.
- The second sheet is your “Works Cited” page—a list that includes every source of information you used to answer these questions.

Use available Internet and print resources (like books and pamphlets).

Here the format for listing sources on your Works Cited page:

### For books or other printed resources:

Author(s). “Title of Article or Chapter”. Publication Title. Date published. pages #-#

### For websites:

Author(s). “Website Title”. Date published or updated. www.websitelink.com

### For photos:

Photographer’s Name. www.websitelink.com

Authors or photographers name should be listed as last name, first initial. If there are multiple authors, separate each individual by a comma, e.g., Doe A., Ray B., and Mei C.

If no author is listed, you can use an organization’s name instead, e.g., National Institutes of Health.

If you cannot find one of the components in the format mentioned above, just skip that part and provide the information that is available.

**Where can you find reliable information about mercury for your presentation?**

- Agency for Toxic Substances and Disease Registry's Don't Mess with Mercury Website—For Students: <http://www.atsdr.cdc.gov/dontmesswithmercury/students.html>
- "Mercury Containing Devices/Products" by North Dakota Department of Health—Waste Management: <http://www.ndhealth.gov/wm/Mercury/MercuryContainingDevicesProducts.htm>
- Public Service Announcement from EPA Region 9: <http://www.epa.gov/region9/psa/mercury/>
- "Mercury" by National Institutes of Health: <http://kids.niehs.nih.gov/explore/pollute/mercury.htm>
- US EPA's Mercury Page: <http://www.epa.gov/mercury/index.html>
- Mercury in Schools Case Studies: <http://www.epa.gov/mercury/casestudies.htm#3>

You may also want to consult library books on mercury.

**Step 2: Design the poster**

Think carefully about the messages and images that will best deliver the answers to the four questions above. Design your poster to present that information along with other information that may help protect people's health

Completion: Your group should turn in one package containing one copy of each of the following:

- Project Submission Form
- Answer Sheet
- "Works Cited" page
- Poster
- Each member's grading rubric



## Instructions

You have decided to write a newspaper article to educate your peers about the dangers of mercury exposure. You are going to work on this alone.

Your name: \_\_\_\_\_

Your article should teach your audience answers to the following four questions:

1. What are the characteristics (physical properties) of elemental mercury?
2. How can exposure to mercury affect the human body?
3. Which objects might contain mercury?
4. What should a student do if s/he finds mercury?

## Step 1: Background Research

You will need two separate sheets of paper.

- One should be used as your “Answer Sheet” to write down the answers to the four questions above.
- The second sheet is your “Works Cited” page—a list that includes every source of information you used to answer these questions.

Use available Internet and print resources (like books and pamphlets).

Here the format for listing sources on your Works Cited page:

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Where can you find reliable information about mercury for your presentation?

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- "Mercury Containing Devices/Products" by North Dakota Department of Health—Waste Management: <http://www.ndhealth.gov/wm/Mercury/MercuryContainingDevicesProducts.htm>
- Public Service Announcement from EPA Region 9: <http://www.epa.gov/region9/psa/mercury/>
- "Mercury" by National Institutes of Health: <http://kids.niehs.nih.gov/explore/pollute/mercury.htm>
- US EPA's Mercury Page: <http://www.epa.gov/mercury/index.html>
- Mercury in Schools Case Studies: <http://www.epa.gov/mercury/casestudies.htm#3>

You may also want to consult library books on mercury.

## Step 2: Draft your article

Provide your readers the answers to the questions above, along with other health-promoting information. Make your story interesting and use one or two pictures.

Completion: You should turn in one package containing one copy of each of the following:

- Project Submission Form
- Answer Sheet
- "Works Cited" page
- Newspaper article
- Grading rubric

Find out if you can get  
 your article published in  
 the school newspaper!



## RADIO ANNOUNCEMENT

*Project Submission Form—Side A*

### Instructions

You have decided to create a radio announcement to educate your peers about the dangers of mercury exposure.

Names of group members: \_\_\_\_\_

Your announcement should teach your audience answers to the following four questions:

1. What are the characteristics (physical properties) of elemental mercury?
2. How can exposure to mercury affect the human body?
3. Which objects might contain mercury?
4. What should a student do if s/he finds mercury?

### Step 1: Background Research

You will need two separate sheets of paper.

- One should be used as your “Answer Sheet” to write down the answers to the four questions above.
- The second sheet is your “Works Cited” page—a list that includes every source of information you used to answer these questions.

Use available Internet and print resources (like books and pamphlets).

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**For photos:**

Photographer’s Name. www.websitelink.com

Authors or photographers name should be listed as last name, first initial. If there are multiple authors, separate each individual by a comma, e.g., Doe A., Ray B., and Mei C.

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**Where can you find reliable information about mercury for your presentation?**

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- "Mercury Containing Devices/Products" by North Dakota Department of Health—Waste Management: <http://www.ndhealth.gov/wm/Mercury/MercuryContainingDevicesProducts.htm>
- Public Service Announcement from EPA Region 9: <http://www.epa.gov/region9/psa/mercury/>
- "Mercury" by National Institutes of Health: <http://kids.niehs.nih.gov/explore/pollute/mercury.htm>
- US EPA's Mercury Page: <http://www.epa.gov/mercury/index.html>
- Mercury in Schools Case Studies: <http://www.epa.gov/mercury/casestudies.htm#3>

You may also want to consult library books on mercury.

## Step 2: Write the script

On a new sheet of paper, write what each actor will say. The radio PSA should take 1 to 2 minutes to perform. If you need help, ask your teacher. Assign roles to group members and practice your radio PSA.

Completion: Your group should turn in one package containing one copy of each of the following:

- Project Submission Form
- Answer Sheet
- "Works Cited" page
- Script
- Each member's grading rubric





## What is mercury?

Mercury is a naturally occurring element that is found in oceans, rocks, and soils. It can be found as a pure element—elemental (metallic) mercury—or as a compound—organic and inorganic mercury.

**Note:** ATSDR's *Don't Mess with Mercury Lesson Plans* are about **elemental mercury** and do not discuss the other forms of mercury.

## Quick facts about elemental mercury

1. Mercury's symbol on the Periodic Table of Elements is "Hg," which is an abbreviation for the Greek word hydragyrum (liquid silver). Its atomic number is 80.
2. Physical properties of elemental mercury:
  - Mercury is the only metal that is liquid at room temperature.
  - Even at room temperature, mercury evaporates into an odorless vapor that is invisible to the unaided eye.
  - Mercury is very dense. Two tablespoons of mercury weighs about 1 pound.
  - Mercury has a high surface tension, which makes it very slippery. When it is spilled, it breaks into many small drops, known as beads.
  - Mercury is a good conductor of heat and electricity.
3. Some people call elemental mercury quicksilver.
4. Breathing in mercury vapors is the most common way to get mercury poisoning—and also the most dangerous.
5. Spilled mercury beads easily spread and hide in small spaces (like cracks in the floor). They can release vapors that can be inhaled by students and staff even years after a spill.
6. Mercury has been used to make many different kinds of products, including devices used in schools. These include glass thermometers, thermostats, electrical switches, gauges, and science laboratory equipment, among others.
7. Because mercury is a hazardous chemical, many manufacturers have removed it from consumer products.
8. Mercury is not a banned substance and some products still contain it. For example, compact fluorescent light (CFL) bulbs contain a small amount of mercury. Note, that if a bulb breaks, the amount of mercury in the CFL is so small that it will not produce enough vapor to make people sick. However, it is still important to clean up safely and properly.



## Instructions for students who find mercury

- **DON'T** mess with it.
- **DON'T** touch it.
- **DON'T** walk through it or get it on your clothes, backpack or other things.
- **DO** find an adult and ask for help.

## Health effects of mercury

- Mercury poisoning can affect the nervous system, lungs, and kidneys.
- Inhaling mercury vapors can cause different symptoms depending on how long and how much of the vapor people inhale.

Inhaling <b>high levels</b> of vapors for a <b>short period</b> of time	Inhaling <b>low levels</b> of vapors for a <b>long period</b> of time
• Nausea, vomiting, diarrhea	• Feeling anxious or tired
• Headaches	• Lack of appetite
• Shortness of breath	• Trembling (shaking)
• Eye irritation and vision problems	• Memory problems
• Chest pain	• Hearing problems

## Differences between elemental mercury and other forms of mercury

- Unlike organic and inorganic mercury, which are compounds, elemental mercury is pure, i.e., it is not chemically bonded to other elements.
- Organic mercury is mainly methylmercury. Due to environmental pollution, fish may contain mercury that they have accumulated through the food chain.
- Ethylmercury is another form of organic mercury. It is found in some vaccine preservatives and some antiseptics.
- Inorganic mercury compounds are found in batteries, some disinfectants, and some health remedies and creams.
- All three forms of mercury are harmful to human health.

## Elemental mercury resources

- Websites:
  - » Agency for Toxic Substances and Disease Registry's Don't Mess with Mercury—For Students website: <http://www.atsdr.cdc.gov/dontmesswithmercury/students.html>
  - » Ohio EPA public service announcement highlighting mercury vapors: <http://www.youtube.com/watch?v=tpqP3ReC1cQ>
  - » North Dakota Department of Health. Mercury Containing Devices/Products: <http://www.ndhealth.gov/wm/Mercury/MercuryContainingDevicesProducts.htm>
  - » US EPA Region 9. Public Service Announcement: Mercury Is Toxic: <http://www.epa.gov/region9/psa/mercury/>
  - » US EPA's Mercury Page: <http://www.epa.gov/mercury/index.html>
  - » Mercury in Schools Case Studies: <http://www.epa.gov/hg/casestudies.htm>
- Books:
  - » Lew, Kristi. Mercury (Understanding the Elements of the Periodic Table). New York, NY: Rosen Publishing Group, 2009.
  - » Watt, Susan. The Elements: Mercury. Tarrytown, New York: Benchmark Books, 2005.

## Contact ATSDR for more information about elemental mercury

- Sue Casteel: [scasteel@cdc.gov](mailto:scasteel@cdc.gov)
- Dr. Michelle Watters: [mwatters@cdc.gov](mailto:mwatters@cdc.gov)